



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/759,672 | 01/12/2001 | James T. St. John | 8194-469 | 2703 |
| 27045 | 7590 | 06/18/2004 | EXAMINER | |
| ERICSSON INC. 6300 LEGACY DRIVE M/S EVR C11 PLANO, TX 75024 | | | MACE, BRAD THOMAS | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2663 | 4 |

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/759,672

Applicant(s)

ST. JOHN, JAMES T.

Examiner

Brad T. Mace

Art Unit

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-24 is/are allowed.
- 6) ☒ Claim(s) 1-12, and 25-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: the word "be" should be omitted on line 12 of pg. 3. The reference number 350 should be 450 on line 27 of pg. 10. Details of Figure 6 on lines 21-25 of pg. 13 do not correlate with the drawing. Details of Figure 7 on lines 12-17 of pg. 14 do not correlate with the drawing. Appropriate correction is required.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference 230 of Figure 2. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because reference 660 of Figure 6 shows the QoS greater than 3, where in the specification it is determined if QoS is less than 3 (line 21 of pg. 13). Also, reference 760 of Figure 7 shows the QoS greater than 3, where in the specification it is determined if QoS is less than 3 (lines 12-13 of pg. 14). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4 and 25-26 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,240,066 ("Nagarajan et al.").

Regarding claims 1, 25, and 26:

6. Nagarajan et al. teaches a method, means, and computer implementation (thus having a computer readable program medium and computer readable program code) (lines 36-39, col. 3) of allocating bandwidth among a plurality of classes (queues) (lines 17-18, col. 3, see Figure 1, and lines 38-39, col. 3). Each of the plurality of classes (queues) is associated with a quality of service and bandwidth allocation (quantum value) (lines 48-54, col. 3). Determining available bandwidth allocation (available quantum value) is based on the aggregate total resource allocations (total amount of committed bandwidth) on the downstream links (channel) (see Figure 1) for all of the classes (queues) sharing the total available resources (total amount of bandwidth) on the downstream links (channel) (see Figure 1, and lines 61-67, col. 5 through lines 1-7, col. 6). The updating of bandwidth allocation (quantum value) of each of the plurality of classes (queues) by a dynamic bandwidth partitioning (update quantum value) corresponding to respective ones of the plurality of classes (queues) (lines 44-51, col.

3). The dynamic bandwidth partitioning (update quantum value) being based on the aggregate total resource allocations and the total available resources (collectively the available quantum value) (lines 61-67, col. 5 through lines 1-2 of col. 6), the tight bandwidth allocation (total reserved quantum value) corresponding to the allocation of the appropriate amount of bandwidth meeting the exact amount of stored information (packets enqueued in the plurality of queues) (lines 48-59, col. 3) for frequency updates (update period) (lines 54-59, col. 3), and the quality of service associated with the respective class (queue) (lines 6-8, col. 4).

Regarding claim 2:

7. Nagarajan et al. teaches that the bandwidth allocation (quantum values) correspond to the quality of service associated with the respective class (queue) (lines 36-44, col. 3).

Regarding claim 3:

8. Nagarajan et al. teaches the step of determining the available bandwidth allocation (available quantum value) where the available bandwidth allocation (available quantum value) is based on the (calculated) aggregate total resource allocations (total amount of committed bandwidth) on the downstream links (channel) (see Figure 1) for all of the classes (queues) sharing the (calculated) total available resources (total amount of bandwidth) on the downstream links (channel) (see Figure 1, and lines 61-67, col. 5 through lines 1-7, col. 6). Since the available bandwidth allocation (available quantum value) is determined, this infers that the result comes from determining the difference between the aggregate total resource allocations (total amount of committed

Art Unit: 2663

bandwidth) on the downstream links (channel) and the total available resources (total amount of bandwidth) on the downstream links (channel).

Regarding claim 4:

9. Nagarajan et al. teaches that bandwidth resources (total amount of committed bandwidth) on the downstream links (channel) (see Figure 1) is based on a given current traffic (voice traffic, data traffic, signaling traffic) (lines 1-5, col. 9).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,240,066 ("Nagarajan et al.") in view of U.S. Patent No. 6,104,700 ("Haddock et al.").

Regarding claims 5-7:

12. Nagarajan et al. discloses substantially all the claimed invention from above. In addition, Nagarajan et al. discloses the (calculating) tight bandwidth allocation (total reserved quantum value) for the frequency update (update period) based on the adjustment of (current) bandwidth allocation (minimum reserved quantum value) of each of the plurality of classes (queues) (lines 24-35, col. 6). Nagarajan et al. also discloses that the updating of bandwidth allocation (quantum value) of each of the plurality of classes (queues) by a dynamic bandwidth partitioning (update quantum value)

corresponding to respective ones of the plurality of classes (queues) (lines 44-51, col. 3). However, Nagarajan et al. does not disclose expressly that the update quantum value for each of the plurality of queues comprises: zero when the available quantum value is less than zero, the minimum reserved quantum value for the update period plus an excess quantum value for the update period when the available quantum value is larger than the total reserved quantum value, and the minimum reserved quantum value for the update period minus a deficit quantum value for the update period when the total reserved quantum value is larger than the available quantum value.

Haddock et al. discloses updating current bandwidth (update quantum value) for a plurality of queues (lines 66-67, col. 9 through lines 1-7, col. 10 and lines 51-58, col. 10). Haddock et al. discloses that queues having a current bandwidth that is greater than or equal to the peak or maximum bandwidth (current and maximum bandwidth determines available quantum value) are ineligible for transmission (thus yielding a zero value in terms of available quantum value because of ineligibility of transmission since current bandwidth is greater than maximum bandwidth, which means a value less than zero in terms of available quantum value) (lines 20-23, col. 10). Haddock et al. discloses that queues having a current bandwidth (total reserved quantum value) that is below their peak bandwidth (available quantum value) and below their minimum bandwidth (minimum reserved quantum value) are categorized together (lines 13-16, col. 10). It can be inferred that when the bandwidth of each queue are updated (lines 66-67, col. 9 through lines 1-7, col. 10 and lines 51-58, col. 10), the excess bandwidth (excess quantum value, difference between peak and current bandwidths) is added to

Art Unit: 2663

the minimum reserved bandwidth (minimum reserved quantum value) for the update time period when the peak bandwidth (available quantum value) is larger than the current bandwidth (total reserved quantum value) in order to make the bandwidth allocation amongst the queues more efficient. Haddock et al. discloses that queues having a current bandwidth (total reserved quantum value) that is greater than or equal to their minimum bandwidth (minimum reserved quantum value), but less than both their maximum bandwidth and their peak bandwidth (available quantum value) are categorized together (lines 16-20, col. 10). It can be inferred that when the bandwidth of each queue are updated (lines 66-67, col. 9 through lines 1-7, col. 10 and lines 51-58, col. 10), the deficit bandwidth (deficit quantum value, difference between current and peak bandwidths) is subtracted from the minimum reserved bandwidth (minimum reserved quantum value) for the update time period when the current bandwidth (total reserved quantum value) is larger than the peak bandwidth (available quantum value) in order to make the bandwidth allocation amongst the queues more efficient. Since the current bandwidth (total reserved quantum value) corresponds to the quality of service associated with the respective queue (lines 51-58, col. 10), so then does the excess bandwidth (excess quantum value) and deficit bandwidth (deficit quantum value). Also, since the current bandwidth (total reserved quantum value) is adjusted at time intervals, it is then proportional to the quality of service associated with the respective queue (lines 51-58, col. 10), and so is then the excess bandwidth (excess quantum value) and deficit bandwidth (deficit quantum value).

A person of ordinary skill in the art would have been motivated to employ Haddock et al. in Nagarajan et al. in order to have efficient dynamic bandwidth partitioning (updating quantum value) based on minimum bandwidth (minimum quantum value), peak bandwidth (available quantum value), and current bandwidth (total reserved quantum value). The suggestion/motivation to employ Nagarajan et al. in Haddock et al. would have been to make efficient bandwidth allocation amongst the plurality of queues. At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains to combine Haddock et al. with Nagarajan et al. (collectively "Nagarajan et al. – Haddock et al.") to obtain the invention as specified in claims 1, 5, and 6 and in claims 1, 5, and 7.

Regarding claim 8:

13. Nagarajan et al. – Haddock et al. further discloses that the method is implemented in on a network that employs a non-deterministic access protocol (broadband multiple access system) (lines 59-60, col. 13).

Regarding claims 9, 10:

14. Nagarajan et al. – Haddock et al. further discloses that the current bandwidth is updated periodically upon the expiration of a predetermined time period (constant or variable update interval) (lines 3-7, col 10).

Regarding claim 11:

15. It can be inferred that the update period is a current time minus a time of the last update period since this is how the update period would be calculated in a non-constant update interval.

Art Unit: 2663

16. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,240,066 ("Nagarajan et al.") in view of U.S. Patent No. 6,359,861 ("Sui et al.").

Regarding claim 12:

17. Nagarajan et al. discloses substantially all the claimed invention but does not disclose expressly that the plurality of queues contain a plurality of packets that are processed using a deficit round robin algorithm.

Sui et al. discloses a plurality of queues (see Figure 1) having queue management (processing) of packets using a deficit round robin algorithm (lines 10-16, col. 1).

A person of ordinary skill in the art would have been motivated to employ Sui et al. in Nagarajan et al. in order to obtain a more efficient means in managing (processing) packets in queues. The suggestion/motivation to do so would have been to allow a queue being processed to be able to send multiple packets whose cumulative size does not exceed that of the allowed bandwidth. In addition, the packets whose cumulative size does exceed that of the allowed bandwidth are not transmitted, allowing other packets to be processed first. At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains to combine Sui et al. with Nagarajan et al. (collectively Sui et al. - Nagarajan et al.) to obtain the invention as specified in claims 1 and 12.

Allowable Subject Matter

18. Claims 13-24 are allowed.

19. The following is an examiner's statement of reasons for allowance:

Claim 13 is allowable over the prior art of record since the cited references taken individually or in combination fails to disclose: "a bandwidth differential circuit configured to determine an available quantum value based on a total amount of committed bandwidth on a downstream channel and a total amount of bandwidth on the downstream channel." Also, "a quantum updating circuit configured to update the quantum values of each of the plurality of queues by an update quantum value corresponding to respective ones of the plurality of queues, the update quantum values being based on the available quantum value, a total reserved quantum value corresponding to packets enqueued in the plurality of queues for an update period and the quality of service associated with the respective queue."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

*Yin discloses a method and apparatus for servicing multiple queues

*Chow et al. discloses a two-component bandwidth scheduler having
application in multi-class digital communications system

*Wong discloses packet scheduling using dual weight single priority queue

*Maher, III et al. discloses a method and apparatus for enforcing service
level agreements

*Bonomi et al. discloses a method for integrated traffic shaping in a packet
switched network

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brad T. Mace whose telephone number is (703)-306-5454. The examiner can normally be reached on M-F, with the exception of every other Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (703)-305-4798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

btm

Brad T. Mace
Examiner
Art Unit 2663

btm
June 4, 2004


RICKY NGO
PRIMARY EXAMINER